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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,916	07/08/2005	Sung-Hoon Kim	3364P195	6399

7590 07/11/2008

Blakely Sokoloff
Taylor & Zafman
7th Floor
12400 Wilshire Boulevard
Los Angeles, CA 90025

EXAMINER	
HASSAN, SARAH	

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
07/11/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/511,916	KIM ET AL.	
	Examiner	Art Unit	
	SARAH HASSAN	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 October 2004* is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *March 21, 2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-7 are pending in this office action.

Priority

2. Acknowledgement is made of applicant's claim for foreign priority under 35 U.S.C. 119 (a)-(d) based on application KR 2002-0020845 filed on April 17, 2002.

Information Disclosure Statement

3. The information disclosure statement (IDS) filed on March 21, 2005 is in compliance with the provisions of 37 CFR 1.97, and has been considered. A copy is enclosed with this office action.

Drawings

4. The drawings filed on October 18, 2004 are acceptable for examination.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 1-5 rejected under 35 U.S.C. 103(a) as being unpatentable over Namekata, US Patent No. 5673294 published on September 30,**

1997 in view of Goldstein et. al., US Patent No. 6002713 published on December 14, 1999.

7. As to claim 1, Namekata teaches “a Viterbi decoder for correcting errors during a transmission procedure in a blind mode” [see column 11, lines 30-48; see Figure 1, item 14]. Namekata specifically teaches a Viterbi processor (14) that is coupled with a transmission path impulse response estimation unit (15) in order to estimate the transmission path impulse response based on the received signal as detailed in column 11, lines 42-46, which corresponds to "blind mode."

“output signal of the Viterbi decoder and symbols in accordance with a training mode and a blind mode” [see column 11, lines 30-48; see Figure 1, item 14]. Namekata specifically teaches a Viterbi processor (14) that is coupled with a transmission path impulse response estimation unit (15) in order to estimate the transmission path impulse response based on the received signal as detailed in column 11, lines 42-46, which corresponds to "blind mode." In addition, Namekata also teaches “training mode” [see column 11, lines 59-65; see Figure 3, items 37, 312].

“inputting the output signal of the Viterbi decoder and symbols into the” [see Figure 1, item 14, 18] “filter” [see column 12, lines 7-9; see Figure 1, item 128, 129].

“a Kalman gain calculating block” [see column 4, lines 6, 13-19]. Namekata specifically teaches a Viterbi decoder that uses maximum likelihood sequence estimation (MLSE) which typically employs and LMS

algorithm that calculates the Kalman gain using the transmission path impulse response estimation unit (see column 4, line 15) which corresponds to "Kalman gain calculating block."

“an error signal calculating block for calculating an error signal” and “calculated error signal” [see column 11, lines 41-44; see Figure 1, item 17].

“the output signal of the Viterbi decoder with one another” [see Figure 1, item 14, 18].

It should be noted however that Namekata does not teach “a forward filter and a backward filter for receiving an input signal and a predetermined signal and performing filtering to the signals.”

“a training symbol storing block for storing training symbols.”

“a switching block”

“a tap coefficient updating block for updating a tap coefficient of the filters."

“equalized signal.”

On the other hand, Goldstein teaches “a forward filter” (132) “and a backward filter” (140) “for receiving an input signal and a predetermined signal and performing filtering to the signals” [see Figure 4, item 132, 140, 131, 139]. Both the forward filter (132) and backward filter (140) receive an input signal and another input signal that is outputted from the tap

“a training symbol storing block for storing training symbols” [see Figure 4, item 137; column 6, lines 48-49].

"a switching block" [see Figure 4, item 161].

"a tap coefficient updating block for updating a tap coefficient of the filters" [see Figure 4, item 131, 139].

"equalized signal" [see Figure 4, item 134, R; see column 3, lines 62-65].

It would have been obvious to one of ordinary skill in the art to combine the teachings of Namekata with the teachings of Goldstein because Goldstein's decision feedback equalizer (see Figure 4, item 130) effectively compensates for ISI which overall improves the performance of any system as detailed in column 4, lines 16-17.

8. As to claim 2, Namekata teaches "the Kalman gain calculating block" and "by applying a fast Kalman algorithm" [see column 4, lines 6, 13-18].

"a blind mode" [column 11, lines 42-46]. Namekata specifically teaches a Viterbi processor (14) that is coupled with a transmission path impulse response estimation unit (15) in order to estimate the transmission path impulse response based on the received signal as detailed in column 11, lines 42-46, which corresponds to "blind mode."

Goldstein teaches "updates the tap coefficient" [see Figure 4, item 131, 139].

9. As to claim 3, Namekata teaches "the Viterbi decoder uses a Viterbi decoding algorithm in a blind mode" [see column 11, lines 30-48; see

Figure 1, item 14]. Namekata specifically teaches a Viterbi processor (14) that is coupled with a transmission path impulse response estimation unit (15) in order to estimate the transmission path impulse response based on the received signal as detailed in column 11, lines 42-46, which corresponds to "blind mode." In addition, Namekata also teaches "training mode" [see column 11, lines 59-65; see Figure 3, items 37, 312].

10. As to claim 4, Namekata teaches "the Viterbi decoder reduces a tracing back length to use the reduced tracing back length in obtaining errors" [see Figure 1, item 14]. Namekata specifically teaches a Viterbi processor (14) that when operated, generates and error signal (see column 11, lines 40-44) which corresponds to "obtaining errors."

Goldstein teaches "for tap coefficient updating." [see Figure 4, item 131, 139].

11. As to claim 5, Namekata teaches "the Viterbi decoder" and "to obtain errors" [see Figure 1, item 14]. Namekata specifically teaches a Viterbi processor (14) that when operated, generates and error signal (see column 11, lines 40-44) which corresponds to "obtaining errors."

Goldstein teaches "for tap coefficient updating" [see Figure 4, item 131, 139].

12. **Claims 6-7 rejected under 35 U.S.C. 103(a) as being unpatentable over Namekata, US Patent No. 5673294 published on September 30, 1997, Goldstein et. al., US Patent No. 6002713 published on December 14, 1999, and further in view of Limberg et. al., US Patent No. 6426780 filed on September 15, 1999.**

13. As to claim 6, Namekata teaches "is applied to a data duration blind algorithm using the Viterbi decoder" [see column 11, lines 30-48; see Figure 1, item 14]. Namekata specifically teaches a Viterbi processor (14) that is coupled with a transmission path impulse response estimation unit (15) in order to estimate the transmission path impulse response based on the received signal as detailed in column 11, lines 42-46, which corresponds to "blind mode."

    It should be noted however that Namekata does not teach "a symbol location of a robust stream is previously recognized."

14. On the other hand Goldstein teaches "a symbol location of a robust stream is previously recognized." [see Figure 4, item 134, R; see column 3, lines 62-65]. The examiner understood this limitation corresponding to an equalized signal.

    It should be noted however that Namekata, Goldstein do not teach "when an E-VSB is applied."

    On the other hand Limberg teaches "when an E-VSB is applied" [see column 1, lines 19-21].

It would have been obvious to one of ordinary skill in the art to combine the teachings of Namekata, Goldstein with the teachings of Limberg because Limberg provides efficient and cheaper filtering for suppression of interference as detailed in column 2, lines 29-36.

15. As to claim 7, Namekata teaches “a Viterbi decoder for correcting errors during a transmission procedure in a blind mode” [see column 11, lines 30-48; see Figure 1, item 14]. Namekata specifically teaches a Viterbi processor (14) that is coupled with a transmission path impulse response estimation unit (15) in order to estimate the transmission path impulse response based on the received signal as detailed in column 11, lines 42-46, which corresponds to "blind mode."

“output signal of the Viterbi decoder and symbols in accordance with a training mode and a blind mode” [see column 11, lines 30-48; see Figure 1, item 14]. Namekata specifically teaches a Viterbi processor (14) that is coupled with a transmission path impulse response estimation unit (15) in order to estimate the transmission path impulse response based on the received signal as detailed in column 11, lines 42-46, which corresponds to "blind mode." In addition, Namekata also teaches “training mode” [see column 11, lines 59-65; see Figure 3, items 37, 312].

“inputting the output signal of the Viterbi decoder and symbols into the” [see Figure 1, item 14, 18] “filter” [see column 12, lines 7-9; see Figure 1, item 128, 129].

“a Kalman gain calculating block” [see column 4, lines 6, 13-18]. Namekata specifically teaches a Viterbi decoder that uses maximum likelihood sequence estimation (MLSE) which typically employs and LMS algorithm that calculates the Kalman gain using the transmission path impulse response estimation unit (see column 4, line 15) which corresponds to "Kalman gain calculating block."

“an error signal calculating block for calculating an error signal” and “calculated error signal” [see column 11, lines 41-44; see Figure 1, item 17].

“the output signal of the Viterbi decoder with one another” [see Figure 1, item 14, 18].

It should be noted however that Namekata does not teach “a forward filter and a backward filter for receiving an input signal and a predetermined signal and performing filtering to the signals.”

“a training symbol storing block for storing training symbols.”

“a switching block”

“a tap coefficient updating block for updating a tap coefficient of the filters."

“equalized signal.”

“an equalizer for removing multi-path distortion generated in a transmission channel by equalizing the input signal.”

On the other hand, Goldstein teaches “a forward filter” (132) “and a backward filter” (140) “for receiving an input signal and a predetermined

signal and performing filtering to the signals" [see Figure 4, item 132, 140, 131, 139]. Both the forward filter (132) and backward filter (140) receive an input signal and another input signal that is outputted from the tap

"a training symbol storing block for storing training symbols" [see Figure 4, item 137; column 6, lines 48-49].

"a switching block" [see Figure 4, item 161].

"a tap coefficient updating block for updating a tap coefficient of the filters" [see Figure 4, item 131, 139].

"equalized signal" [see Figure 4, item 134, R; see column 3, lines 62-65].

"an equalizer for removing multi-path distortion generated in a transmission channel by equalizing the input signal" [see column 3, lines 53-61]

It should also be noted however that Namekata, Goldstein do not teach "a tuner for receiving an RF signal from an antenna and synchronizing the RF signal with a local oscillation signal to transform the RF signal into an IF signal"

"an NTSC removing filter for removing an NTSC component from the
IF signal to prevent degradation of an HDTV due to the NTSC component"

"a phase tracer for removing phase noise from the equalized signal"

"a trellis decoder for performing trellis decoding with respect to an output signal of the phase tracer and outputting a decoded signal"

"a data de-interleaver for performing reverse interleaving to the decoded signal"

"an RS decoder for performing Reed-Solomon decoding to the output signal of the data de-interleaver so as to generate error-corrected bit streams"

"a de-randomizer for providing the output,signal of the RS decoder to other elements of the VSB signal receiving system"

On the other hand, Limberg teaches "a tuner for receiving an RF signal from an antenna and synchronizing the RF signal with a local oscillation signal to transform the RF signal into an IF signal" [see column 5, lines 20-23; Figure 1, item 1].

"an NTSC removing filter for removing an NTSC component from the IF signal to prevent degradation of an HDTV due to the NTSC component" [see column 14, lines 19-24].

"a phase tracer for removing phase noise from the equalized signal" [see column 6, lines 12-15].

"a trellis decoder for performing trellis decoding" and "outputting a decoded signal" [see column 7, lines 39-42].

"a data de-interleaver for performing reverse interleaving to the decoded signal" [see column 7 , lines 43-47].

"an RS decoder for performing Reed-Solomon decoding to the output signal of the data de-interleaver so as to generate error-corrected bit streams" [see column 7, lines 46-48].

"a de-randomizer for providing the output,signal of the RS decoder to other elements of the VSB signal receiving system" [see column 7, lines 50-53].

It would have been obvious to one of ordinary skill in the art to combine the teachings of Namekata, Goldstein with the teachings of Limberg because Limberg provides efficient and cheaper filtering for suppression of interference as detailed in column 2, lines 29-36.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SARAH HASSAN whose telephone number is (571)270-3456. The examiner can normally be reached on Monday through Friday (available 8:00 AM - 5:00PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571)272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. H./
Examiner, Art Unit 2611

/Mohammad H Ghayour/
Supervisory Patent Examiner, Art Unit 2611